

Application Number 09/885,223
Amendment in response to Office Action mailed March 27, 2007

JUN 27 2007

REMARKS

This Amendment is responsive to the Office Action dated March 27, 2007. Applicants have amended claims 29 and 32. Claims 44-49 are withdrawn as being directed to non-elected inventions. Claims 1-43 and 50-53 remain pending.

In the Office Action, the Examiner rejected claims 1-25 and 50-52 under 35 U.S.C. 103(a) as being unpatentable over Bender (US 6,747,964) in view of Hui (US 6,198,749). Claims 28-43 also appear to have been rejected as being unpatentable over Bender in view of Hui.

In addition, the Examiner rejected claims 26, 27, and 53 under 35 U.S.C. 103(a) as being unpatentable over Bender Hui and Aukia et al. (US 6,594,268).

Applicants respectfully traverse the rejections. The applied references fail to disclose or suggest the features of Applicants' claims. Indeed, the applied references appear to have little or no relevance, whatsoever, to the specific features recited in Applicant's claims. The primary Bender reference, for example, is concerned with wireless mobile devices.

The only similarity between the applied references and Applicants' claims appears to be that some of the applied references generally deal with multi-link protocols. The primary Bender reference, however, is not concerned with routers, nor any network device that includes interface cards or service cards. In addition, Bender (as well as the secondary references applied by the Examiner) fails to disclose or suggest any device that performs the claimed routing functions to and from a service card (such as a multi-link service card) in order to sequence data packets as recited in Applicants' claims.

In stark contrast to the wireless mobile devices disclosed in Bender, Applicants claims' generally concern routers (or other network devices) that are equipped with a multi-link service card to handle multi-link protocols with respect to packets received via other interface cards. Applicants' claims recite performing a first routing operation that route received packets from interface cards to the multi-link service card for sequencing or fragmentation according to the multi-link protocol. In addition, Applicants' claims also recite second routing operations that route packets from the multi-link service card to the interface cards, e.g., following the multi-link sequencing or fragmentation performed at the multi-link service card.

Applicant's claim 1 literally requires that the routing operations are performed *in accordance with routing information that reflects a topology of a computer network, wherein*

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the routing information identifies the multi-link service card as a destination for the data packets. That is, claim 1 literally requires a router capable of routing unsequenced data packets to network destinations according to routing information. According to claim 1, however, the destination is defined within the routing information (e.g., a routing table) as a multi-link service card within the router itself. Thus, the claimed multilink service cards are represented as network destinations within the routing information and normal routing operations are performed to route unsequenced data packets to those destinations for sequencing. This technique allows the router to perform routing operations on unsequenced data packets and advantageously view internal multilink service cards as network destinations. None of these features are disclosed or suggested in the applied references.

The Examiner misinterpreted the prior art relative to the features of Applicants' claims. For example, the cited passages of Bender do not disclose or suggest the features attributed to such passages by the Examiner. Furthermore, the secondary references fail to remedy the deficiencies of Bender relative to Applicants' claims. Even in combination, the cited references fail to teach or suggest many of the recited claim elements.

It appears that Examiner has once again copied the features recited in Applicants' claims into the Office Action, and cited several passages prior art passages as disclosing such features without factual justification. The cited passages of Bender, while teaching techniques that concern multi-link protocols, clearly lack the specific features required by Applicants' claims. Furthermore, the Hui reference in combination with Bender fails to remedy the deficiencies of Bender relative to Applicants' claims. Accordingly, the Examiner's rejections must be withdrawn.

For the Examiner's convenience, Applicants again provide a brief summary of the claimed inventions. This summary has already been explained on the record several times, yet the Examiner has persisted with rejections that are clearly deficient with respect to the features of Applicants' claimed invention. Nevertheless, Applicants respectfully submit the explanation once again for the Examiner's convenience.

Applicants' claims generally concern a router or network device that includes one or more interface cards (IFCs) and a separate service card, such as a multi-link service card (MLSC). Various claims are directed to methods, routers and network devices. In addition,

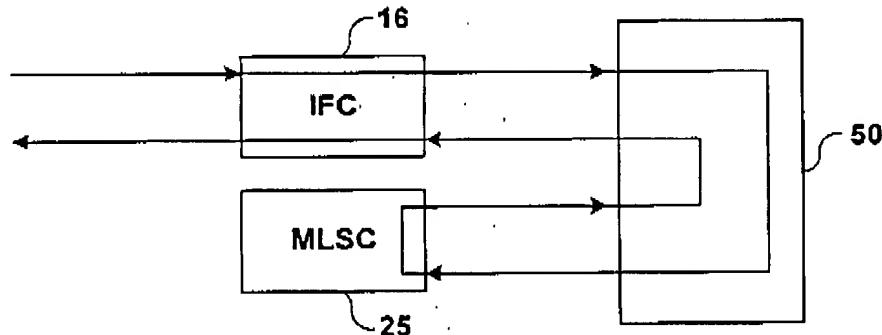
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some of the claims, such as claim 34, are directed to the MLSC, i.e., the service card itself, which can be inserted into a network device to provide multi-link services for packets received and forwarded from other interface cards already present within the network device. The interface cards of the network device or router are used for sending and receiving multi-link network communications, while the separate MLSC may be used for fragmenting or sequencing the communications. Alternatively, in claim 50, packet prioritization is performed in the service card rather than fragmentation or sequencing.

In any case, according to various claims, a routing component of the router or network device applies a first routing operation to the packets received from a plurality of links in one or more interface cards so as to route the packets to the service card within the device. At the service card, the packets are sequenced, fragmented or prioritized and then directed back to the routing component, which applies a second routing operation and forwards the packets to the one or more interface cards for transmission on the network. As explained above, multilink service cards are represented as network destinations within the routing information maintained by the router, and the router performs routing operations to identify destinations for data packets. Consequently, unsequenced data packets are routed to multi-link service card(s) as network destinations in order to sequence the packets. The sequencing of data packets with multilink service cards that are represented as network destinations within routing information is one feature of Applicant's claims that is not even remotely suggested by the cited prior art.

An example of this architecture can be seen, e.g., in FIG. 5B of Applicants' disclosure, which is reproduced below. In FIG. 5B, IFC 16 represents an interface card, 50 represents the routing control unit, and MLSC 25 represents a separate service card.

FIGURE 5B



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According to several of the pending claims (and not shown in any of the prior art to date), a separate service card (such as MLSC 25) can be selectively added to the router for processing of packet communications. MLSC 25 need not receive packets directly from any links, but instead may resides solely within the router or network device and nevertheless assigned a separate network address for purposes of supporting multi-link protocols (or other services such as prioritization) for packets received from other interface cards. The other interface cards, for example, may not otherwise support sequencing or fragmentation according to such multi-link protocols.

In other words, as shown in FIG. 5B (above), interface card 16 and MLSC 25 are distinct structural cards (sometimes called "line cards") of the router or network device. Interface card 16 receives a set of data blocks from a source within a computer network according to a multi-link protocol. Routing control unit 50 is coupled to the interface card 16 and multi-link service card 25. Routing control unit 50 performs a routing function to select a network destination based on the routing information and forwards that the set of data blocks from the interface card 16 to that network destination, which is in fact the internal the multi-link service card 25 for sequencing the data. The arrows extending leftward in FIG. 5B from interface card 16 represent communications to and from the network over links to and from interface card 16. Notably, MLSC 25 may not even include such links to the outside network.

The use of a separate multi-link service card to sequence packets that were sent according to a multi-link protocol allows a router or other network device to be upgraded to include the multi-link service functionality via a distinct card, e.g., that can be inserted or removed from the router (see dependent claim 53). By representing the multi-link service card as a destination within the routing information, the router is able to forward unsequenced data to this destination without substantial modification to the forwarding logic, e.g., when one or more multi-link service cards have been installed in the router.

Contrary to the statements in the Office Action, the Bender reference fails to disclose or suggest the features of Applicants' claims. Bender describes a wireless mobile device that includes a multi-link protocol processor that aggregates different information signals from different wireless modems into a point-to-point protocol (PPP) format. This allows PPP format information from wireless devices to be transmitted over the internet. To receive data in the PPP

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format in the wireless mobile device of Bender, the multi-link protocol processor aggregates a bundle of information and separates the information into its constituents parts for modulation by the different modems.

Nothing in Bender suggests that the multi-link protocol processor resides in a service card. Furthermore, Bender fails to suggest any routing operations that cause received packets to be routed to a service card for multi-link processing. Instead, information is sent and received directly through the multi-link protocol processor of Bender, without any routing operations, whatsoever. Furthermore, Bender also fails to suggest a second routing operation to forward sequenced, fragmented or prioritized information from the service card to interface cards of the network device for communication over the computer network, as recited in various ones of Applicants' claims.

In short, almost every feature recited in Applicants' claims is lacking from Bender and Hiu. For example, Bender and Hiu fail to disclose or suggest the reception of data packets from a plurality of links in one or more interface cards of a network device according to a multi-link protocol that allows multiple physical links to be treated by the network device as a single logical link, as recited in independent claim 1. Contrary to the Examiner's interpretation, the device of Bender does not include any interface cards, whatsoever. In addition, Bender and Hiu also fail to suggest, prior to sequencing the data packets in the network device, performing a first routing operation to forward the data packets from the one or more interface cards to a multi-link service card of the network device in accordance with routing information that reflects a topology of a computer network, wherein the routing information identifies the multi-link service card as a destination for the data packets.

Furthermore, Bender and Hiu fail to suggest sequencing the data packets with the multi-link service card of the network device, or performing a second routing operation in accordance with the routing information to forward the sequenced data packets from the multi-link service card to the interface cards of the network device for communication over the computer network. Each and every feature of claim 1 is lacking from the applied references.

Given Applicants previous responses and explanation of these features to the Examiner, it is perplexing that the Examiner is relying on Bender, as the only similarity between Baker and the features of Applicants' claims appears to be the use of multi-link protocols. Unlike Bender,

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Applicants claims' concern routers that are equipped with a multi-link service card that handles multi-link protocols with respect to packets received via other interface cards. Bender describes a wireless mobile unit, and fails to disclose or suggest anything akin to a service card.

Furthermore, Applicants' claims recite first routing operations that route received packets from interface cards to the multi-link service card for sequencing or fragmentation according to the multi-link protocol. In addition, Applicants' claims also recite second routing operations that route packets from the multi-link service card to the interface cards, following the multi-link sequencing or fragmentation performed at the multi-link service card. Contrary to the Examiner's statements in the Office Action, none of these features are disclosed or suggested in Bender.

Applicants' claims specifically require the use of one or more interface cards to send and receive packets, and a separate service card to sequence, fragment or prioritize the packets. Following processing by the service card, packets are forwarded back to the interface cards for transmission on the network. Bender, in opposite, fails to suggest any of these features. Instead, Bender describes a multi-link processor within a mobile unit that sends and receives multi-link information directly, without executing any routing operations, whatsoever. In Bender, packets are not received via interface cards, routed to a service card for multi-link servicing, and routed back to the interface cards for outbound communication over the network.

The secondary Hiu reference also fails to remedy these clear deficiencies of Baker. In the Office Action, the Examiner appears to have cited Hiu simply to demonstrate that network devices are known. In particular, the Examiner seemed to recognize that the wireless mobile unit of Baker is not a router or other network device, but cites Hiu as disclosing a network device that supports multi-link protocols. The Hiu reference, however, does not remedy the deficiencies of Bender outlined above. For example, the Hiu reference, like Bender, does not disclose or suggest a first routing operation to forward the data packets from the one or more interface cards to a multi-link service card. In addition, like Bender, Hiu fails to disclose or suggest sequencing the data packets with the multi-link service card of the network device, or performing a second routing operation in accordance with the routing information to forward the sequenced data packets from the multi-link service card to the interface cards of the network device for communication over the computer network.

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The Aukia reference also fails to remedy the deficiencies of Bender outlined above. The Aukia reference is being cited simply to demonstrate that a device that includes a plurality of interface cards was known. However, none of the applied references (alone or in combination) suggests a device that includes interface cards and a mult-link service card, where first routing operations send received packets from the interface cards to the mult-link service card for sequencing, fragmentation or prioritization, and second routing operations send the packets back to the interface cards for outbound communication over the network.

As a final note, Applicants once again challenge the Examiner's characterization of the various claims as "containing similar limitations" to claim 1. Some claims, such as claim 32 recite features different than claim 1 (e.g., fragmentation rather than sequencing performed in the MLCS). These features were not specifically addressed in the Office Action. In any case, the comments above demonstrate clear patentable distinctions between the applied references and all pending claims. Applicants reserve further comment on the other claims at this time.

Given the clear deficiencies with respect to the independent claims, Applicants reserve further comment on the dependent claim at this time. However, Applicants do not acquiesce to any of the Examiner's rejections or characterizations of the prior art.

CONCLUSION

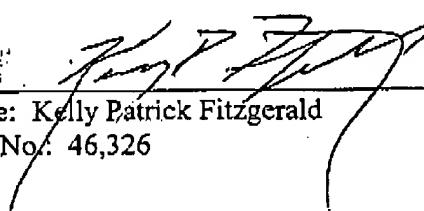
All claims in this application are in condition for allowance. Applicants respectfully request reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

June 27, 2007

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